

ABSTRACT OF THE INVENTION

A satellite communications system having ground user terminals, hubs, and a geosynchronous satellite. The satellite generates a network of spot beam coverage areas on the earth. A hub and at least one ground terminal are located in each of at least two spot beams. A first user terminal transmits an uplink signal according to a first signal protocol to the hub through the satellite. A second user terminal receives a downlink signal according to a second signal protocol through the downlink spot beam from the hub through the satellite. The hub may be located in the same spot beam coverage area as the first or the second user terminal or may be located in an altogether different spot beam coverage area. Through selective frequency and/or polarization routing on board the satellite, a hub located within a "parent" beam can communicate with user terminals within the parent beam at a specified frequency and polarization, and can communicate with users in other "dependent" beams on a different frequency and/or polarization. This routing allocates the total available bandwidth between parent and dependent beams. The system enables asynchronous communications between each hub and the satellite to maximize frequency re-use and the overall capacity of the system.

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